



Rocket Pump®
210-1000 Series

Operating Instructions

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Form #37717 - Rev 1004

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Indicates a caution or warning



Indicates a reminder

These Pocket Pump Operating Instructions are also available in Spanish and French Canadian. Visit www.skinc.com.

Notice: This operating instruction may not address all safety concerns (if any) associated with this product and its use. The user is responsible for determining and following the appropriate safety and health practices and regulatory limitations (if any) before using the product. The information contained in this document should not be construed as legal advice, opinion, or as a final authority on legal or regulatory procedures.

Description

SKC Pocket Pump is an advanced low flow sample pump combining light weight and compact design with PC compatibility. When used with SKC sampling media such as sorbent sample tubes, the Pocket Pump is efficient and accurate for performing TWA, STEL, and Ceiling sampling for organic gases and vapors. A Pocket Pump model with twin ports for bag sampling is available as Cat. No. 210-1002A.

The result of extensive research and development, the Pocket Pump exemplifies SKC's commitment to quality and innovation in industrial hygiene sampling equipment.



*Single port Pocket Pump for
sorbent tube sampling
(UL Listed)*




*Twin port Pocket Pump
(Cat. No. 210-1002A) for
sorbent tube sampling and
bag sampling (not UL Listed)*


Flow Range: 20 to 225 ml/min

Performance Profile

Flow Range in Constant Flow Mode:	20 to 225 ml/min
Accuracy Variance Between LCD Reading and Actual Flow Rate (after calibration):	20 to 225 ml/min \pm 5%
Constant Flow Compensation Range (inlet only):	20 to 225 ml/min up to 20 inches water back pressure
Flow Control:	Holds constant flow to \pm 5% of the set-point
Pressure Range in Constant Pressure (multiple-tube sampling) Mode (inlet only):	<ul style="list-style-type: none">• 1 to 10 inches water (1.87 to 18.7 mm Hg) at maximum flow rate of 200 ml/min• 10 to 20 inches water (18.7 to 37.4 mm Hg) at maximum flow rate of 100 ml/min
Constant Pressure (multiple-tube sampling) Mode Accuracy:	Pressure reading \pm 0.5 inches water (0.25 mm Hg)
Battery Charge Level Indicator:	Icon displays at full, mid, and low charge
Temperature Range:	Operating: 32 to 113 F (0 to 45 C) Charging: 40 to 100 F (5 to 38 C) Storage: -4 to 113 F (-20 to 45 C)
Operating Humidity:	0 to 95% non-condensing

 *Protect sample pump from weather when in use outdoors.*

Run Time: <i>(dependent on sample media used)</i>	<ul style="list-style-type: none">• With NiMH battery: 12 hrs at 200 ml/min up to 10 inches water back pressure 12 hrs at 100 ml/min up to 20 inches water back pressure <i>(Run time is 8 hrs at either setting if using a NiCad battery.)</i>• Connected to charger: Extended run time
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- RFI/EMI shielded
 - CE marked
 -  Listed for intrinsic safety (single port models only)
 - Model 210-1002TX is ATEX approved

Performance Profile

Timer:	1 to 9999 min display $\pm 1\%$ accuracy
Flow Fault:	If the pump is unable to compensate for longer than 15 seconds due to excessive back pressure, the pump enters FLOW FAULT mode. The pump goes into HOLD, the fault icon appears on the display, and the accumulated run time display is frozen and retained. After 5 minutes in flow fault, auto-restart is attempted every 5 minutes until flow is corrected or the user removes the pump from flow fault mode by pressing [▲▼].
Battery Pack:	<ul style="list-style-type: none">• Rechargeable nickel-metal hydride (NiMH) battery pack, 2.4 V x 1.0 Ah• Rechargeable nickel cadmium (NiCad) battery pack, 2.4 V x 0.6 Ah
Charge Time: <i>(varies with battery capacity and level of discharge)</i>	Attached to pump: ≤ 6 hrs Detached from pump: 16 hrs <i>(recommended charging method for initial charge of a new battery pack)</i>
Size:	4.5 x 2.2 x 1.4 in (11.4 x 5.6 x 3.6 cm) - see photo below
Weight:	5 oz (142 gm)



The use of a repaired or rebuilt battery pack voids any warranty and the UL Listing for intrinsic safety.

Note: Newer pump models contain an NiMH battery. An NiMH battery can be used with older Pocket Pump models. Order NiMH Battery Pack Part No. P20129-2.

Note: Pocket Pump was designed to minimize inherent noise. If the noise level is distracting when worn in a shirt pocket, clip the pump on a waist belt.



Battery Installation/Charging

Installing/Replacing the Battery Pack



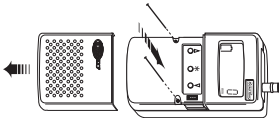
To enhance battery life, SKC ships battery packs separate from the pump.

Completely charge a new battery pack *detached* from the pump before installing.

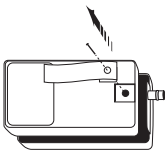
1. Completely charge the new battery pack detached from the pump (see page 6). This initial slow (16-hour) charge will provide optimum battery performance. Following charging, install the new battery pack.



2. Press down on the sliding keypad cover near the SKC logo. Push the keypad cover down and away from the display until it is free from the pump case.



3. Lay the pump on a flat surface with the LCD facing upward. Remove the two screws on the front panel of the pump.



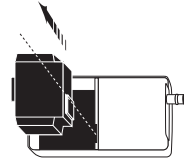
4. Turn the pump over so that the LCD faces down. Remove the belt clip by unscrewing the single locking screw, and remove the battery compartment cover.



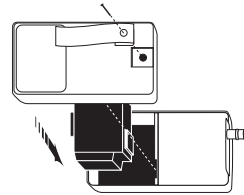
The use of a repaired or rebuilt battery pack voids any warranty and the UL Listing for intrinsic safety.

Battery Installation/Charging

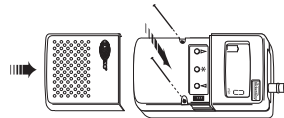
5. If replacing the battery, unplug the old battery pack by carefully lifting it upward, and remove it from the pump.



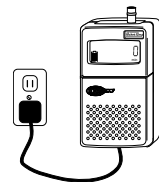
6. Align the jack on the new/replacement battery pack with the pins on the pump. Press into place. Replace the battery compartment cover and belt clip removed in Step 4.



7. Turn the pump over so that the LCD faces upward. Replace the two screws on the front panel of the pump (do not overtighten the screws). Replace the keypad cover by aligning it with the ridges on each side of the keypad, pressing it down, and pushing it upward.



For subsequent charging, charge battery pack attached to the pump (see page 6).



Do not charge or operate the pump with the charger in hazardous locations.



Use only the SKC-approved battery pack designated for the Pocket Pump to ensure reliable performance and to maintain the SKC warranty and UL Listing for intrinsic safety.



Use only the SKC-approved chargers to charge this pump.

Battery Installation/Charging

Battery Pack Charging System

The SKC Pocket Pump features the innovative “Smart Charging Battery System.” The advanced technology of the battery pack’s circuitry provides multiple features:

- It allows the battery pack to regulate the charge it receives by reducing its fast charge rate to a trickle charge rate when the battery is at maximum capacity thus preventing damage to the battery.
- It is also designed to prevent harm to the battery by charging only if the battery is within its acceptable charging temperature range of 40 to 100 F (5 to 38 C). Outside of this range, the battery will only accept the low output trickle charge.

Charging the Battery Pack

Note: *The initial charge of a new battery should be performed with the battery **detached** from the pump. For installation after charging, see pages 4 and 5.*



Ensure proper orientation of charging cable before plugging it into the charging jack. Improper orientation/contact will short-circuit the battery.



Short-circuiting the battery pack will render it immediately inoperative.

Battery detached: Plug the charger into a standard wall outlet and the charging plug into the port on the battery pack. This type of charge is a slow trickle charge that is recommended for the initial charge of a new battery pack. This charge will take approximately 16 hours to complete.

Battery attached: For a complete charge, ensure pump is **not** running. Plug the charger into a standard wall outlet and the charging plug into the battery port on the bottom of the pump. The fast charging function of the battery pack will completely recharge the battery in approximately 6 hours or less.

- ♦ *During “fast-charging,” the battery icon displays a solid outline with three flashing bars.*
- ♦ *During “trickle-charge” and upon receiving a full charge, the battery icon is a solid outline with three solid bars.*



After charging the battery pack, it is good practice to run the pump for approximately 5 minutes before calibrating. This ensures the battery is in more steady-state conditions and improves the agreement in pre and post-sampling calibrations.

See page 8 for Determining Battery Charge Levels.



Unplug the charging plug from the Pocket Pump battery port when finished charging the battery pack. If the charger is unplugged from a wall outlet and the charging plug is left in place, the battery charge will deplete.



Do not charge or operate the pump from charger in hazardous locations.



Ensure the computer interface port is covered before, during, and after charging.



Failure to follow warnings and cautions voids any warranty.

Battery Installation/Charging

Charging Fault

When the top bar is flashing and the bottom two bars are solid, a charging fault has occurred. A charging fault may be caused by:

- *Ambient temperatures that are out of charging temperature range*
- *A defective battery pack*
- *A disrupted charge cycle*



To remove a charging fault, unplug the charger, allow the pump to equilibrate to ambient temperature, and try to charge the battery again. If the icon display persists, call SKC at 724-941-9701.

FAIL Display

Symptom: Press [▲▼] from HOLD mode to RUN the pump. Pump will not run and immediately goes back to HOLD mode.

Display: Press * to scroll through display until FAIL appears.

Explanation: FAIL is a type of fault caused by battery capacity that is insufficient to start the pump motor. This indicates a battery pack that has either developed a fault or is at the end of its life. ***The fault cannot be fixed by recharging the failing battery pack.***

Solution: Remove the battery pack and replace with a new, fully charged battery pack. Run the pump and scroll through the display. If the pump runs and FAIL is not displayed, the fault is fixed. If FAIL still displays, there is a fault in the pump electronics. Send the pump to SKC for repair.



Use only SKC-approved batteries to ensure reliable performance and intrinsic safety.



Using a non-approved charger voids any warranty and could damage the pump or battery.

Battery Installation/Charging

Determining Battery Charge Level

- The pump will operate for up to 12 hours with a NiMH battery (eight hours with NiCad) at a flow rate of 200 ml/min and back pressure of 10 inches of water. Pump operation time will increase as flow rate and back pressure rates are decreased.
- The LCD shows the current battery charge level. The icons appear as follows:



Three bars indicate a full charge (normally appear after charging), approximately 70 to 100%.



Two bars indicate that the battery is charged enough to operate the pump, approximately 15 to 70%.



One bar indicates battery charge is low (charge battery), approximately less than 15%.



When the battery has lost all of its charge, all bars are clear and the outline is flashing. The pump goes into HOLD mode and then to SLEEP mode in approximately one minute.

Extended Runs Using the Charger

Extended operation is possible in **nonhazardous locations** using the pump with its battery charger plugged into a wall outlet.

Note: *The battery will discharge during an extended run. However, when the charge drops by 50%, the fast charge feature is initiated until the battery receives a full charge. This cycle repeats every several hours during operation.*



Do not charge or operate pump from charger in hazardous locations.



Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.

Interpreting Pump Operating Terms

In this manual, “run time data” refers to all the terms listed below:

- FLOW: Flow rate in milliliters per minute (ml/min)
VOLUME: Total volume of air in milliliters (ml) or liters (L) since reset
PRESSURE: Pump back pressure measured in inches (ins) of water or millimeters (mm) of Hg
TEMP: Temperature of incoming air in C or F
RUN TIME: Time pump has run in minutes (min) since reset
FAIL: A type of fault indicating insufficient battery capacity (*see page 7*)

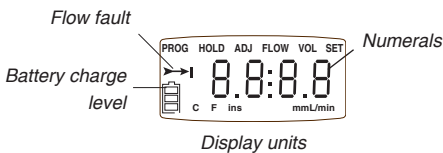
Interpreting the LCD Operating Indicators

- PROG: Active when a program is loaded into the Pocket Pump memory by DataTrac® Software
HOLD: Active when the Pocket Pump is in HOLD mode
ADJ: Active when the Pocket Pump is being flow calibrated
FLOW: Active when the LCD shows the flow rate
VOL: Active when the LCD shows the volume of air pumped
SET: Flashes when setting the flow rate

Icons

- Flow Fault: Flashes during flow fault (*see graphic below and page 11*)
Battery: Shows battery charge status (*see graphic below and page 8*)

Operating indicators



Flow Fault Icon



Battery Icon

Setup

Operating the Keypad

The Pocket Pump operates by pressing various sequences of the three keypad buttons located beneath the sliding cover. Operate the Pocket Pump with the following key sequences:



Pocket Pump Keypad

Star Button *

- Scrolls through run time data and setup options displayed on the LCD

Up and Down Arrow Buttons ▲ ▼

- Toggle between display units and increase or decrease sampling parameters in setup

Underlined Sequence *▲▼* (Security Code)

- Press buttons in sequence within 10 seconds of the previous command.
- Pocket Pump operating parameters cannot be changed without pressing the security code sequence.
- The security code may be required at various points during programming.

Bracketed [▲ ▼]

- Press buttons simultaneously.



Button sequences are shown in the order in which the buttons should be pressed.



Pressing both the up and down arrow buttons simultaneously places a running pump in HOLD or a holding pump in RUN.

Determining Pump Operating States



RUN

- The pump is sampling and run time data is updated continuously in memory.

HOLD

- The pump is not sampling and run time data is stored. Hold displays on the LCD.
- Temperature and back pressure readings are still active and shown on the LCD.


FLOW FAULT ()

- If the pump is unable to compensate for longer than 15 seconds due to excessive back pressure, the pump enters FLOW FAULT mode and the flow fault icon displays on the LCD.
- The pump goes into HOLD mode and the accumulated run time display is frozen and retained.
- The pump attempts to restart sampling after five minutes in flow fault and continues to attempt a restart every five minutes thereafter until the flow is corrected or the user removes the pump from flow fault mode by pressing [ ].

SLEEP

- The LCD shuts down and the electronic circuitry enters a low power state. The pump automatically enters SLEEP mode after five minutes in HOLD unless the battery charger is plugged in or a keypad button is pressed.

FAIL

- A fault state in which the battery capacity is insufficient to run the pump motor (*see FAIL Display on page 7*)
- FAIL displays on the LCD as part of the data display. Press  to scroll to the FAIL display.



To change the pump from HOLD to RUN, press [ ].



To change the pump from RUN to HOLD, press [ ].



To change the pump from SLEEP to HOLD, press any button.



Flow Fault Indicator

The time the pump is in Flow Fault mode is not added to run time or cumulative volume.

Setup

Setting Up the Pump

To activate the pump:

- Press any keypad button. The LCD will show the pump serial number for two seconds followed by a firmware revision number.

To obtain run time data:

- Press the * button repeatedly to scroll through run time data.

To reset the data display to zero:

- With the pump running, press:

[▲▼] to place in HOLD, *▲▼* to enter Setup, and **.

The LCD will show briefly the pump serial number, firmware version number, and run time at 0 minutes. This will reset all run time data except the flow setting. *See instructions on page 15 to change the flow setting.* If you do not want to reset the run time data after entering the security code, stop and wait 10 seconds to break the sequence. The LCD will stop flashing at this point.

To determine pump operating mode (constant flow or constant pressure):

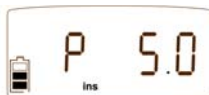
- Observe the LCD. Use the * button to scroll through the displays if necessary.

Constant flow mode



1 to 3 digit number is displayed with "mL/min" and "FLOW"

Constant pressure mode (Multiple tube)



1 to 3 digit number is displayed with "P" and "ins" or "mm"



*Pump run time is a converse relationship: Low flow + low Bp = longer run time
High flow + high Bp = shorter run time*

To change pump operating mode (constant flow or constant pressure):

- With the pump running, press:

[▲▼] to place in HOLD, *▲▼* to enter Setup, and *▼▲*.

The display will now show the new operating mode.

For information on operating the pump in constant pressure mode, see Advanced Operation on page 21.

To determine pump display:

- **Standard display** includes flow, volume, and run time. Press * to scroll through run time data.
- **Enhanced Display** includes flow, volume, back pressure, temperature, and run time. Press * to scroll through run time data.

To select pump display:

- **Standard to Enhanced Display:**

With pump running, press:

[▲▼] to place in HOLD, *▲▼* to enter Setup, and *▲▲*

The enhanced data display will include **flow, volume, back pressure, temperature, and run time**.

- **Enhanced to Standard Display:**

With pump running, press:

[▲▼] to place in HOLD, *▲▼* to enter Setup, and *▼▼*

The standard data display will include **flow, volume, and run time**.

To select temperature scale display:

- In enhanced display, the temperature of incoming air can be shown in either Celsius (C) or Fahrenheit (F). Use the * button to scroll to the temperature scale display units.

Setup

To change temperature scale display:

- In enhanced display and with the pump running, press:

[▲▼] to place in HOLD, *▲▼* to enter Setup, and [*▼]

Press * to scroll to the temperature display. The display will show the newly selected temperature scale.

To select pressure units display:

- In enhanced display, back pressure can be shown in either inches (ins) of water or millimeters (mm) of mercury. Use the * button to scroll to the back pressure display units.

To change back pressure units display:

- In enhanced display and with the pump running, press:

[▲▼] to place in HOLD, *▲▼* to enter Setup, and [▲*]

Press * to scroll to the pressure display. The display will show the newly selected pressure unit.



Underlined** keypad button sequences indicate that the buttons must be pressed in sequence **within 10 seconds of the previous command.



Bracketed** keypad button sequences indicate that buttons must be pressed **simultaneously.

Calibrating and Sampling in Constant Flow Mode — Single Sorbent Tube

Calibration



Before use, allow the pump to equilibrate after moving it from one temperature extreme to another.

1. Ensure pump has run for 5 minutes before proceeding with calibration.
2. Set the pump for Constant Flow mode (see pages 12 and 13).
3. Using a length of tubing, connect the pump inlet to a representative sorbent tube using an SKC tube holder.
4. Connect the exposed end of the tube to a primary standard calibrator using another length of tubing.
5. Press [▲▼] to RUN the pump.
6. Press *▲▼* (security code) within ten seconds. The word **SET** will flash on the LCD.
7. The LCD will display the flow rate set from the last sample taken. If you do not wish to change the flow rate, go to Step 9.
8. Press ▲ or ▼ to change the flow rate to the desired setting as shown on the LCD.



Do not charge or operate pump with charger in hazardous locations.

Operation

9. Press *****. **ADJ** will appear on the LCD. The pump flow rate can now be calibrated using a calibrator. *See note below.*
10. When the flow rate reading appears on the calibrator, press the **▲** or **▼** buttons on the pump keypad to adjust the flow up or down until the **calibrator** displays the desired flow rate.
11. Press ***** to lock in the calibrated flow. The pump will then enter its normal RUN state.
12. Press [**▲▼**] to place the pump in HOLD. Press [**▲▼**], ***▲▼*** (security code), and ****** to reset the data display to zero (minutes that have elapsed during pump setup and/or programming) before sampling.
13. Disconnect the calibrator and replace the representative sample tube with the tube to be used for sampling.

Sampling

1. Clip sampling medium to a worker's collar in the breathing zone and place the pump in the worker's shirt pocket or clip to the worker's belt.
2. Press [**▲▼**] to RUN the pump and begin sampling.
3. Press [**▲▼**] to HOLD the pump and stop sampling. Run time data is retained in memory after sampling is completed. While the pump is in HOLD mode, use the ***** button to scroll through run time data on the LCD.
4. Remove and cap tube. Replace representative tube in holder and reconnect the calibrator. Verify that the flow rate has remained within 5% of the pre-sample calibrated flow.



When calibrating, the flow rate displayed on the calibrator will change as a result of this adjustment, not the flow rate displayed on the pump.



Protect sample pump from weather when in use outdoors.



Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.

Calibrating and Sampling in Constant Flow Mode — Multiple Tubes

For use with constant pressure controller and multi-port adjustable low flow tube holders

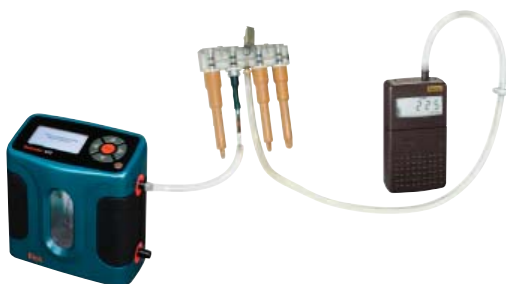
The Constant Pressure Controller or CPC (Cat. No. 224-26CPC-10) is a pump accessory that provides a simple alternative for multiple sorbent tube sampling while in Constant Flow mode. In conjunction with an Adjustable Low Flow Tube Holder (Cat. No. 224-26-02, 224-26-03, or 224-26-04), the CPC is used as a pressure regulator to maintain a constant 10 inches water back pressure. *For multiple-tube applications without a CPC, see Advanced Operation on page 21.*

Calibration



Before use, allow the pump to equilibrate after moving it from one temperature extreme to another.





1. Ensure pump has run for 5 minutes before proceeding with calibration.
2. Set the pump for Constant Flow mode (*see pages 12 and 13*) and set it to the selected flow rate (*see pages 15 and 16, Steps 5 through 12*). Pump flow rate must be set at $\geq 15\%$ higher than the sum of the flow rates through all tubes.
3. Connect the pump inlet to the CPC outlet (the side of the CPC without a label) with a 1/2 to 1-inch length of Tygon® tubing.
4. Connect the inlet side of the CPC (marked “to sample”) to the Adjustable Low Flow Holder.



Note: When multi-tube sampling with a CPC, the flow rate of the pump must be set at $\geq 15\%$ higher than the sum of the flow rates through all tubes.


Note: When sampling with the CPC accessory, the volume displayed on the pump is no longer representative of the volume of flow through the tubes due to the air bypass function of the CPC.

Operation

5. Label all tubes and ports (e.g., tube #1, port A).
6. Insert opened representative tubes into the ports. Place unopened tubes in any unused ports to “seal” them. This is essential to obtain correct results.
7. Loosen the flow adjust screw on the low flow tube holder port containing the tube to be calibrated. Connect the exposed end of the tube to a primary standard calibrator using another length of tubing.
8. Press [▲▼] to RUN the pump.
9. Turn the flow adjust screw (needle valve) on the adjustable tube holder port until the **calibrator** displays the desired flow rate through the tube. The flow rate displayed on the calibrator changes as a result of this adjustment.
10. To calibrate flow through the remaining tubes, repeat Steps 7 through 9 for each port.
11. Press [▲▼] to place the pump in HOLD mode. Press [▲▼], ▲▼ (security code), and  to reset the data display to zero before sampling.
12. Disconnect the calibrator and replace the representative tubes with the tubes to be used for sampling. The pump is ready to sample.

Sampling

1. Clip the sampling medium to a worker’s collar in the breathing zone and place the pump in the worker’s shirt pocket or clip to the worker’s belt.
2. Press [▲▼] to RUN the pump and begin sampling.
3. Press [▲▼] to HOLD the pump and stop sampling.

Run time data is retained in memory after sampling is completed. While the pump is in HOLD mode, use the  button to scroll through run time data on the LCD.

4. Remove and cap tubes. Reconnect calibration train and verify the flow rate.



*All empty ports must contain **unopened** tubes during calibration and sampling.*



Protect sample pump from weather when in use outdoors.



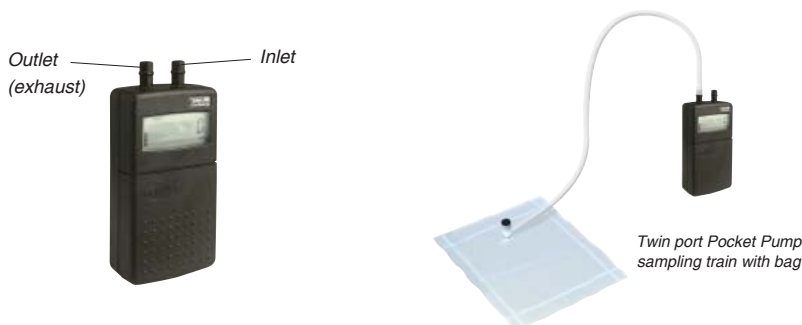
Do not charge or operate pump with charger in hazardous locations.



Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.

Calibrating and Sampling with Bags

Requires Twin Port Pocket Pump Model 210-1002A



Calibration



Before use, allow pump to equilibrate after moving it from one temperature extreme to another.

1. Ensure pump is set in Constant Flow mode (*see pages 12 and 13*).
2. Use tubing to connect a primary standard calibrator to the pump inlet.
3. Press [▲▼] to RUN the pump.
4. Press *▲▼* (security code) within 10 seconds. The word **SET** will flash on the LCD.
5. The LCD will display the flow rate set from the last sample taken. If you do not wish to change the flow rate, go to Step 7.
6. Press ▲ or ▼ to change the flow rate to the desired setting as shown on the LCD.
7. Press *. **ADJ** will appear on the LCD. The pump flow rate can now be calibrated using a calibrator. *See note below.*
8. When the flow rate reading appears on the calibrator, press the ▲ or ▼ buttons on the pump keypad to adjust the flow up or down until the **calibrator** displays the desired flow rate.



When calibrating, the flow rate displayed on the calibrator will change as a result of this adjustment, not the flow rate displayed on the pump.

Operation

9. Press **✱** to lock in the calibrated flow. The pump will then enter its normal RUN state.
10. Press **[▲▼]** to place the pump in HOLD. Press **[▲▼]**, **✱▲▼✱** (security code), and **✱✱** to reset the data display to zero (minutes that have elapsed during pump setup and/or programming) before sampling.
11. Disconnect the calibrator and tubing.

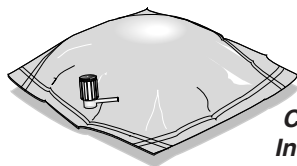
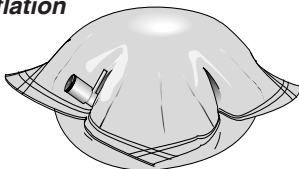
Sampling

1. Ensure the data display has been reset to zero (*see page 12*).
2. Using a length of Teflon tubing, connect the pump outlet (exhaust) to the hose connection on the fitting of a prepared sample bag. Ensure shut-off valve is open on the bag fitting. *See sample bag operating instructions for details.*
3. Press **[▲▼]** to RUN the pump. Sample for the appropriate length of time.



Do not over-inflate sample bag. Avoid filling bag more than 80% of its maximum volume.

**Incorrect
Inflation**



**Correct
Inflation**

4. When sampling is complete, press **[▲▼]** to place the pump in HOLD and stop sampling. Close the shut-off valve on the sample bag fitting. *See sample bag operating instructions for details.*

Calibrating and Sampling in Constant Pressure Mode — Multiple Tubes

For use with multi-port adjustable low flow tube holders only.

Calibration



Before use, allow the pump to equilibrate after moving it from one temperature extreme to another.

1. Ensure pump has run for 5 minutes before proceeding with calibration.
2. Set pump to enhanced display and Constant Flow mode (*see pages 12 and 13*). Remain in these modes until ready to calibrate.
3. Connect the pump to an Adjustable Low Flow Tube Holder (*see Optional Accessories, page 28*). Use a screwdriver to turn all the flow adjust screws counter-clockwise until they are flush with the tube holder surface.
4. Label all tubes and ports (e.g., tube #1, port A).
5. Insert the first opened representative tube (#1) into the first port (“A”), etc. Place unopened tubes in any unused ports to “seal” them. This is essential to obtain correct results.
6. Set the desired flow rate to a primary standard calibrator (*see pages 15 and 16, Steps 5 through 11*) as specified by the method for tube #1 in port A. Record the flow rate. *See cautions below.*
7. While the pump is in RUN, press the * button to scroll to Constant Pressure reading (ins or mm). Record the back pressure for that tube. Press [▲▼] to place the pump in HOLD.
8. Repeat Steps 5 through 7 for each port to obtain the back pressure for each representative tube.



*All empty ports must contain **unopened** tubes during calibration and sampling.*



When performing multiple-tube sampling in Constant Pressure mode, the flow rate must be set as low as possible. The sum of the flow rates cannot exceed 100 ml/min for back pressures from 10 to 20 inches of water; the sum of the flow rates cannot exceed 200 ml/min for calculated back pressures less than 10 inches of water.

Advanced Operation

9. Obtain the calculated back pressure by adding 1 inch to the highest back pressure number and rounding up to the next number. The additional inch allows for typical back pressure fluctuations.

Example using two tubes:

Tube	Port	Flow (ml/min)	Back Pressure (in H ₂ O)
1	A	20	6.2
2	B	50	7.9

Calculated back pressure is 9 (7.9 + 1 = 8.9 rounded to 9).

10. Reinsert opened representative tube #1 back into port A. Place unopened tubes in remaining port(s) to “seal” them.
11. Reset the pump to the desired flow rate for port A as done in Step 6.
12. While the pump is still in RUN, press **✱** to scroll to Constant Pressure reading (ins or mm). Use a screwdriver to turn the flow adjust screw clockwise for port A on the Adjustable Low Flow Tube Holder until the display matches the calculated back pressure. Press [**▲▼**] to place the pump in HOLD.
13. Repeat Steps 10 through 12 for remaining port(s).
14. Place pump in Multiple Tube (Constant Pressure) mode. From RUN, press [**▲▼**] to place pump in HOLD, press **✱▲▼✱** (security code), and **✱▼▲✱**.



*Pressing [**▲▼**] will place a running pump in HOLD and a holding pump in RUN.*



Do not charge or operate pump with charger in hazardous locations.

Advanced Operation

15. Set pump pressure to the calculated back pressure. From HOLD, press [▲▼] to RUN the pump, then enter *▲▼* (security code) within ten seconds. The LCD will display the previously set back pressure, with flashing **SET** and **P** indicators. The flow fault icon may also be flashing at this point.
16. Press ▲ or ▼ to increase or decrease the previously set back pressure setting until it matches the calculated back pressure determined in Step 9. Press * to lock in the pressure setting. The pump will return to its normal RUN state.
17. Reset the data display to zero (minutes that have elapsed during pump setup and/or programming) before sampling by pressing [▲▼] to place pump in HOLD, *▲▼* to enter Setup, and **.
18. Remove the representative tubes used for calibration and insert newly opened tubes in their assigned ports. The pump is now ready to sample.

Sampling

1. Press [▲▼] to RUN the pump and begin sampling.
2. Press [▲▼] to HOLD the pump and stop sampling.

Run time data is retained in memory after sampling is completed. While the pump is in HOLD mode, use the * button to scroll through run time data on the LCD.

3. Remove and cap tubes. Reconnect the calibration train to verify flow rate.



Use of any device other than the approved battery pack to power the pump voids the UL Listing for intrinsic safety.



Protect sample pump from weather when in use outdoors.



*All empty ports must contain **unopened** tubes during calibration and sampling.*

Pump Care

Pump Care

The Pocket Pump has been carefully designed, manufactured, and tested to provide excellent performance. Proper care and maintenance include:

- Avoiding strong impacts
- Keeping the pump dry
- Not cleaning the pump with harsh cleaning solvents or detergents
- Storing the pump in a cool, dry, dust-free location
- If the sampling method used requires collection of the sample via the exhaust port on the pump (sample passes through the pump such as bag sampling with the twin port Pocket Pump), ensure that the sample air is dry and does not contain corrosive constituents. Failure to do so could lead to contamination of the pump, degradation of performance, or failure of the pump. Failure to follow this caution voids any warranty.
- Following instructions in the Battery Installation/Charging section to maximize battery life

Service Policy

To return products to SKC for servicing:

1. Call 800-752-8472 (724-941-9701 for international customers) to obtain a Return Materials Authorization (RMA) number and Product Decontamination Form.
2. Carefully package the product. Mark the RMA number on any correspondence relating to the return and on the outside of the package.
3. Ship to SKC, freight prepaid, to the following address:

SKC Inc.
National Service Center
863 Valley View Road
Eighty Four, PA 15330

Package product carefully to prevent damage during transit. Include a contact name, phone number, shipping address, RMA number, and a brief description of the problem. For nonwarranty repairs, a purchase order number and billing address are also required. The Service Department will contact nonwarranty customers with an estimate before proceeding with repairs.

Note: *SKC Inc. will accept for repair any SKC product that is not contaminated with hazardous materials. Products determined to be contaminated will be returned unserviced.*



SKC Inc. will accept for repair any SKC product that is not contaminated with hazardous materials. Products determined to be contaminated will be returned unserviced.



Use only SKC-approved parts to ensure reliable performance. Failure to do so voids any warranty and the UL Listing for intrinsic safety.



The use of a repaired or rebuilt battery pack voids any warranty and the UL Listing for intrinsic safety.



Failure to follow warnings and cautions voids any warranty.

Accessories

DataTrac for Pocket Pump Software

With the optional DataTrac for Pocket Pump Software accessory, the Pocket Pump is programmable using a PC. DataTrac simplifies chain-of-custody reporting by allowing users the option of programming a complete running sequence, delayed start, timed stop, and intermittent sampling, all at different flow rates. Time and sample volume are continuously updated in memory. There is no need to perform lengthy calculations; DataTrac does it for you. The advanced information retrieval system is specifically designed to store data and provide chain-of-custody information. Fault features allow storage of historical data in memory that can be retrieved up to 24 hours after shutdown.

Features

- Program a sampling operation from a PC
- Calibrate pump flow to a primary standard
- Display the operating mode including Constant Flow or Constant Pressure, temperature, run time, and battery status
- Create a Pocket Pump program on a PC and upload to the pump for operation in the field.
- Program up to fourteen sampling sequences, each with different flow rates
- Download pump run time data and history to a PC
- Create chain-of-custody information using the sample set-up feature
- Print a history file containing pump run time data
- Print a worker exposure profile containing run time data and the pump's history

DataTrac for Pocket Pump System Requirements

- Any IBM compatible PC with a 80486 processor or higher
- Hard drive with a minimum of 20 MB free disk space
- Available serial port or USB to 9-pin serial adapter compatible with the PC and system
- Microsoft Windows® 98 or higher

With DataTrac Software you can...

SKC Sample Sheet Set-up

File Options

SKC Pocket Pump Set-Up Info

Worker (last name) Smith Worker (first name) John Worker ID 219

Sampling Site Unit A

Sample Media Charcoal Tube Sample ID 18744

Method Followed USDA 7

Chemicals of Interest Benzene

Job Description Maintenance

Pre-Sample Calib. SN 24230 Post-Sample Calib. SN 24235

Environmental Conditions

Humidity % 30 Alt. Pressure 30.12

Analysis

Date Sent To Lab 14 Oct 2009 Analyzed By Sally Jones

Date Returned From Lab 16 Oct 2009 Results 0.5 ppm

Sampled By Alice Rose Date 14 Oct 2009 Signature

Audited By Terry Rogers Date 16 Oct 2009 Signature

Comments Replaced valves in AM. Cleaned lines in PM

Create a sample sheet for worker & sample information

SKC Pump History

Mode	Flow Rate	Start Date	Start Time	Volume Substr.	Accum. Volume	Duration (all hours:ms)
1	Stand Flow 1000	Feb 6 2009	1:20:44 PM	19.00	109.1	10:40
2	Hold	Feb 6 2009	1:43:44 PM			9:00
3	Sleep	Feb 6 2009	1:48:44 PM			2:47

Download the pump sampling history

SKC Pump Scheduler

File Options Tools

Pump Program Serial Number 2126

Mode	Rate	Start Date	Stop Date	Duration
Stand	1000	Oct 4 2009	Oct 4 8:00 PM	8:00

Pump Controls

Flow 4:00

Buttons: Insert, Edit, Flow, C Press, Flow Pump

Create a sample schedule selecting the date, time, and flow rates that you wish to sample

SKC Real Time Monitor

File Tools

Pump Real Time Monitor

Flow Calibrate

Approx Correction 0 ml/min

Buttons: Reset

Simply click to change the pump settings

DataTrac for Pocket Pump Software

Includes software and instructions on CD, DataTrac adapter, and DataTrac cable (see page 26 for requirements)

Cat. No. 877-90

Accessories

Optional Accessories

Description	Cat. No.
Defender Primary Standard Calibrator , 5 to 500 ml/min, includes lead-acid battery, charger, software, and 1-meter serial cable	717-510L
Chargers	
5-station, 115 V	223-427
5-station, 230 V	223-107A
Single, 115 V	223-228
Single, 230 V	223-229
DataTrac for Pocket Pump Software , includes software CD, DataTrac adapter, and DataTrac cable (<i>see pages 26 and 27 for details</i>)	877-90
Replacement Parts	
Battery Pack (NiMH)	P20129-2
Battery Pack (NiCad)	P20129-1
Battery Pack (NiCad) ATEX model	P20129TX
Belt Clip	P51821
Case	P20120
Filters (10)	P40010
Keypad	P79360
Pressure Sensor	P20134
Spring Clips	P51102
Screw/Tubing Kit	P21001
Protective Front Cover	P20131
Constant Pressure Controller (CPC) for Pocket Pump	224-26CPC-10
Sample Tube Holders for Constant Flow Applications (includes tube cover)	
Type A (tubes 6-mm OD x 70-mm length)	222-3-1
Type B (tubes 8-mm OD x 110-mm length)	222-3L-1
Type C (tubes 10-mm OD x 150-mm length)	222-3XL-1
Type D (tubes 10-mm OD x 220-mm length)	222-3XD-1
Adjustable Low Flow Tube Holders for Constant Pressure Applications (<i>requires separate tube cover</i>)	
Dual	224-26-02
Tri	224-26-03
Quad	224-26-04
Sample Tube Protective Covers (<i>for adjustable flow tube holders</i>)	
Type A (tubes 6-mm OD x 70-mm length)	224-29A
Type B (tubes 8-mm OD x 110-mm length)	224-29B
Type C (tubes 10-mm OD x 150-mm length)	224-29C
Type D (tubes 10-mm OD x 220-mm length)	224-29D



Use only SKC-approved parts to ensure reliable performance. Failure to do so voids any warranty and the UL Listing for intrinsic safety.

SKC INC. LIMITED ONE YEAR WARRANTY

1. SKC warrants that its instruments provided for industrial hygiene, environmental, gas analysis, and safety and health applications are free from defects in workmanship and materials under normal and proper use in accordance with operating instructions provided with said instruments. The term of this warranty begins on the date the instrument is delivered to the buyer and continues for a period of one (1) year.

This warranty does not cover claims due to abuse, misuse, neglect, alteration, accident, or use in application for which the instrument was neither designed nor approved by SKC Inc. This warranty does not cover the buyer's failure to provide for normal maintenance, or improper selection or misapplication. This warranty shall further be void if changes or adjustments to the instrument are made by other than an employee of the seller, or if the operating instructions furnished at the time of installation are not complied with.

2. SKC Inc. hereby disclaims all warranties either expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose, and neither assumes nor authorizes any other person to assume for it any liability in connection with the sale of these instruments. No description of the goods being sold has been made a part of the basis of the bargain or has created or amounted to an express warranty that the goods will conform to any such description. Buyer shall not be entitled to recover from SKC Inc. any consequential damages, damages to property, damages for loss of use, loss of time, loss of profits, loss of income, or other incidental damages. Nor shall buyer be entitled to recover from SKC Inc. any consequential damages resulting from defect of the instrument including, but not limited to, any recovery under section 402A of the Restatement, Second of Torts.

3. This warranty extends only to the original purchaser of the warranted instrument during the term of the warranty. The buyer may be required to present proof of purchase in the form of a paid receipt for the instrument.

4. This warranty covers the instrument purchased and each of its component parts.

5. In the event of a defect, malfunction, or other failure of the instrument not caused by any misuse or damage to the instrument while in possession of the buyer, SKC Inc. will remedy the failure or defect without charge to the buyer. The remedy will consist of service or replacement of the instrument. SKC Inc. may elect refund of the purchase price if unable to provide replacement and repair is not commercially practicable.

6. (a) To obtain performance of any obligation under this warranty, the buyer shall return the instrument, freight prepaid, to SKC Inc., at the following address:

SKC Inc., National Service Center
863 Valley View Road
Eighty Four, PA 15330 USA

(b) To obtain return authorization information or for further information on the warranty performance you may telephone 724-941-9701 at the above address. See Service Policy section in operating manual (if applicable).

7. This warranty shall be construed under the laws of the Commonwealth of Pennsylvania which shall be deemed to be the situs of the contract for purchase of SKC Inc. instruments.

8. No other warranty is given by SKC Inc. in conjunction with this sale.

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